

STATE OF MAINE
BOARD OF ENVIRONMENTAL PROTECTION

In Re:

EVERGREEN WIND POWER II, LLC)
Oakfield Aroostook County)
OAKFIELD WIND PROJECT) **AFFIDAVIT OF**
L-24572-24-A-N (approval)) **MICHAEL A. NISSENBAUM, M.D.**
L-24572-TF-B-N (approval))

I, Michael Nissenbaum, M.D., being first duly sworn, do depose and say as follows:


1. My name is Michael A. Nissenbaum, M.D. I am a specialist in diagnostic imaging, whose training and work involves developing and utilizing an understanding of the effects of energy deposition, including sound, on human tissues. I am a former Associate Director of MRI at a major Harvard hospital, a former faculty member (junior) at Harvard University, and a published author. A copy of my CV is attached to this Affidavit as *Exhibit A*.
2. I give this Affidavit in support of the concerns of the Martha A. Powers Trust about the Oakfield Wind Project.
3. I have reviewed the documents in the Oakfield Wind Application relating to noise.
4. I am conducting a study at Mars Hill, Maine, where a 28 turbine ridgeline arrangement of 1.5mW turbines exists. The study is nearing completion. An abstract of findings up to this point in time was prepared as part of the prepublication process, and presented to the Chief Medical Officer for Ontario. My preliminary finding in this study as of March, 2009 are attached hereto as *Exhibit B*. An abstract of my updated findings are attached hereto as *Exhibit C*.
5. Based on the Mars Hill, Maine experience, there are concerns regarding deleterious health effects (cascading from chronic sleep disturbance) for any homes that come to lie within 3500 feet of one or more turbines of 1.5mW size, particularly if the dwellings are to be downwind, and downhill from the turbine installation.

1936

6. The nine (9) receiver points in the RSE *Sound Assessment* in the Oakfield Wind Application in Table I are identified as locations within 500 feet of existing dwellings. Based on this Table, I would expect that the residents at these nine (9) dwellings would experience the same or similar adverse health effects, including and especially sleep disturbance, in the same proportions as the affected residents living within 3500 feet of the turbine installation at Mars Hill.

7. It is worth pointing out that pre construction sound modeling in Mars Hill by Resource Systems Engineering (RSE) failed to predict the noise levels eventually experienced, and to the extent the same assumptions were utilized in Oakfield by RSE, there would be concerns about similar failure to accurately predict the sound levels that will actually result

Dated: January 8, 2010

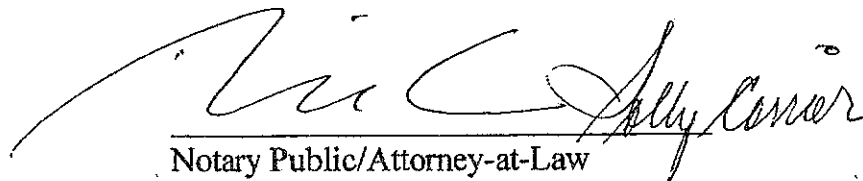

Michael Nissenbaum, M.D.

STATE OF MAINE
Aroostook, ss.

January 8, 2010

Personally appeared the above-named Michael Nissenbaum, M.D., and being sworn, made oath that the foregoing statements by him described are upon his own knowledge, information and belief and that, so far as upon information and belief, that he believes this information to be true.

Before me,


Notary Public/Attorney-at-Law
My commission expires:

SALLY CARRIER
Notary Public, Maine
My Commission Expires
February 1, 2014

Curriculum Vitae - Michael A. Nissenbaum, MD

Address: 194 E. Main St., Fort Kent, ME 04743

Citizenship: Canadian / American

Positions Held:

1998-current:	Solo Radiologist, Northern Maine Medical Center, Fort Kent, ME
1994-1998	Chief, MRI Clinical Services, MRI Scan Center, Ft. Lauderdale, FL
1992-1994	Associate Director to Bob Edelman, MRI, Beth Israel Hospital, Boston, MA, (Harvard Medical School)

Education:

1979	McGill University, Faculty of Arts and Science (Honours Anthropology)
1983 M.D.	University of Toronto, Faculty of Medicine

Postdoctoral Training:

Internships, Residencies, Clinical Fellowships:

1984-1988	Resident, Radiology, McGill University Faculty of Medicine, Montreal, Canada
1983	Intern, Internal Medicine, Mount Sinai Hospital, Toronto, Canada
1988	Armed Forces Institute of Pathology, Washington, DC
1991-1992	MRI Clinical Fellow, Long Beach Memorial Medical Center, Long Beach, CA CA Supervisor: William G. Bradley, Jr., M.D., Ph. D.

Research Fellowship:

1990-1991	Interventional Research Fellow, University of California at San Diego, CA
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Licensures and Certifications:

1984	Quebec License Registration
1986	Ontario License Registration
1989	California License Registration
1991	Massachusetts License Registration
1994	Florida License Registration
1988	Fellow, Royal College of Physicians of Canada
1988	Diplomate, American Board of Radiology
1988	Diplomate, Quebec Board of Medical Specialists (Radiology)
1998	Maine Medical License

1938

Academic Appointments:

1992-94 Harvard Medical School, Boston, MA.

Hospital Appointments:

1989-1990 Attending Radiologist, Alexandra Hospital, Ingersoll, Ontario.
1991-1992 Clinical Fellow, Memorial Medical Center, Long Beach, CA.
1992- 1994 Attending Radiologist, Associate Director of MRI, Beth Israel Hospital, Boston, MA

1998-present Attending Radiologist, Northern Maine Medical Center

Awards and Honours:

1977, 1978, 1979 McGill Scholar -McGill University
1977, 1978, 1979 James McGill Award - McGill University
1988 Chief Resident, Royal Victoria Hospital

Memberships, Offices and Committee Assignments in Professional Societies:

American Roentgen Ray Society -L
Canadian Medical Association
American College of Radiology - L
Radiological Society of North America - L
Associate Member, American Society of Neuroradiology -L

Teaching Experience:

1990 Percutaneous Ethanol Ablation of Hepatic Neoplasia: Tissue Responses, Physiological Effects, and Imaging Characteristics in the Normal Liver, Dept. of Rad. Research Conference, Univ. of CA at San Diego
1991 Interventional Radiology, University of California at San Diego
1991-1992 Monthly Lecturer MR Visiting Fellowship, MRI Instruction to Radiology Residents, University at Irvine Memorial MRI Educational Institute
1992 Lecture: MRA- Current State-of-the-Art. To: Grand Surgical Rounds, Department of Surgery, Beth Israel Hospital, Harvard Medical School. Nov 1992
1993 Lecture: MRI Update: New Diagnostic Applications. To: Internal Medicine Group, Beth Israel Hospital, Harvard Medical School. October 1993
1993 Lecture: Optimization of Magnetic Resonance Angiography. To: Brigham and Womens' Hospital MRI and CT Update: October 1993, Harvard Medical School
1994 Lecture: Advanced MRI Techniques. To: Department of Radiology, Chinese University Hong Kong. December 1994
1995 Ongoing Lectures: Topics in Neurological and Body MRI and MRA (AMA category 1 credits) monthly at MRI Scan Center, Ft. Lauderdale, FL

Editorial Responsibilities:

1992-98 Reviewer, MRI related topics. American Journal of Roentgenology

Principal Clinical and Hospital Service Responsibilities:

1992-94 Associate Director, MRI, Beth Israel Hospital, Boston, MA.
 1994-98 Chief, MRI Clinical Services and Advanced MR Applications
 MRI Scan Centers, Ft. Lauderdale, FL

Grant Support: Seed grant for Tumor Ablation Research, Canadian Radiological
 Foundation Research Award (1988-1989).

Imaging Guided Tumor Ablation Project, Academic Senate of the
 University of California (1990-1991).

Principle Investigator: AMI-25, Superparamagnetic Iron Oxide Contrast
 Agent for use in Assessment of Hepatic Malignancy. 1991-1992 at Long
 Beach Memorial Medical Center
 (Corporate-sponsored, non-peer reviewed)

Bibliography

Original Reports:

1. **Nissenbaum MA**, Jequier S. Enlargement of Adrenal Glands Preceding Adrenal Hemorrhage. JCU. 1988; 16:349.
2. Wei L, **Nissenbaum MA**, Stehling MK, Goldmann A, Edelman RR. Differentiation between Hemangiomas and Cysts of the Liver with Nonenhanced MR Imaging: Efficacy of T2 Values at 1.5T. JMRI 1993
3. Muller MF, Prasad P, Siewert B, **Nissenbaum MA**, Raptopoulos V, Edelman RR. Abdominal Diffusion- Mapping Using a Whole Body Echo Planar System. Radiology, August 1993.
4. Ros PR, Freeny PC, Harms SE, Seltzer SE, Davis PL, Chan TW, Stillman AE, Muroff LR, Runge VM, **Nissenbaum, MA**. Hepatic MR Imaging with Ferumoxides: A Multicenter Clinical Trial. Radiology, August 1995.

Books and Monographs:

1. **Nissenbaum MA**, vanSonnenberg E, D'Agostino HB. Interventional Radiology in the Liver, Biliary Tract, and Gallbladder. In: Schiff E, ed. Diseases of the Liver. J.B. Lippincott Company, 1993. pp 279-298.
2. **Nissenbaum MA**, Adamis MK. Magnetic Resonance Imaging in Rheumatology- An Overview. In: Rheumatology Clinics of North America. Trentham, ed. May 1994.
3. **Nissenbaum MA**. MRI of Bone Marrow Disease, in Magnetic Resonance Imaging, Edelman and Hesselink, 1995.

1940

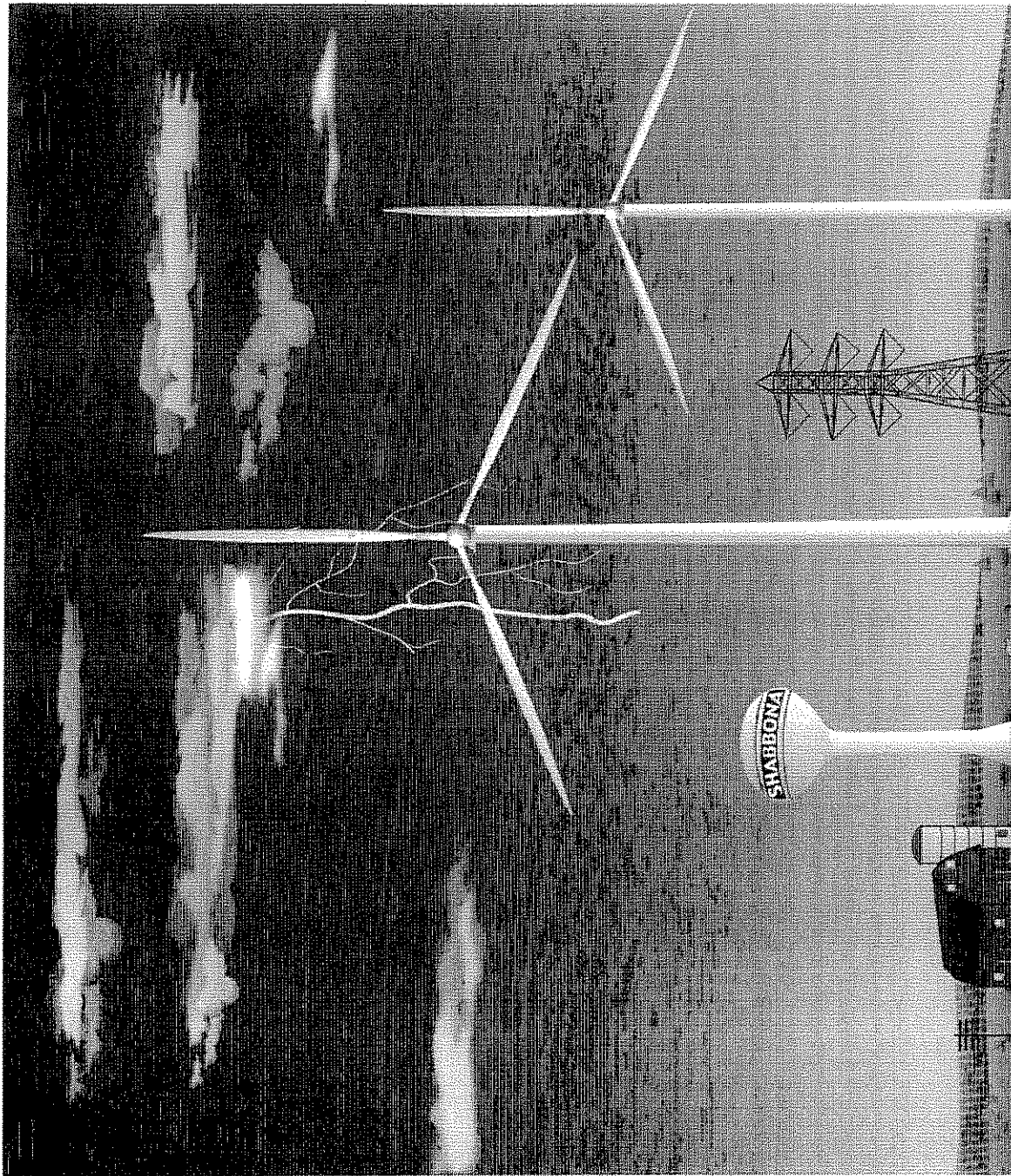
Abstracts:

1. **Nissenbaum MA**, Atkinson DJ, Song SJ, Brown SM, Yan K, Widoff BE, Blitzer J, Bradley WG. Metastatic Lesion Detection in the Liver; Increased Sensitivity of Dynamic Ultrafast MRI. Society for MRI in Med. 1992;
2. **Nissenbaum MA**, Margossian P, Song SJ, Brown SM, Widoff BE, Yan K, Amster JL, Bradley WG. Increases Sensitivity of Black Blood MRA: A Role for Optimized Sequences? Society for MRI in Med. 1992;
3. **Nissenbaum MA**, Palmer N, Widoff BE, Song SJ, Brown SM, Yan K, Amster JL, Bradley WG. MRI of the Post Operative Lumbar Spine: The Value of Gadolinium Enhanced Multiplanar Reconstruction Using 3D Acquired Datasets Yielding 1MM Isotropic Resolution. Society for MRI in Med. 1992;
4. Brown SM, **Nissenbaum MA**, Atkinson DJ, Song SJ, Widoff BE, Yan K, Kurzweil PR, Jackson D, Bradley WG. MR Arthrography with Contrast Enhancement (MR ACE): Evaluation of Articular Cartilage in the Knee. Society for MRI in Med. 1992;
5. Brown SM, Atkinson DJ, **Nissenbaum MA**, Song SJ, Widoff BE, Yan K, Kurzweil PR, Jackson D, Bradley WG. Kinematic MRI of the Knee with Biplane Acquisition. Society for MRI in Med. 1992;
6. Bradley WG, Atkinson DJ, Nitz WR, **Nissenbaum MA**, Song SJ, Widoff BE, Yan K, Brown SM. Quantitative CSF Velocity Imaging: Comparison of Normals and Patients with Shunt-Responsive NPH. Society for MRI in Med. 1992;
7. Bradley WG, Brown SM, Widoff BE, Yan K, Song SJ, **Nissenbaum MA**. Analysis of Aneurysms and AVM's Missed on Routine MR Images which are Detected by MR Angiography. Society for MRI in Med. 1992;
8. **Nissenbaum MA**, Atkinson DJ, Brown SM, Song SJ, Widoff BE, Yan K, Bradley WG. Avoiding T1 Contrast Variability in IR Prepped Ultrafast Imaging Using Breath Holding. Society for MRI in Med. (1992).
9. **Nissenbaum MA**, Palmer N, Widoff BE, Brown SM, Song SJ, Yan K, Amster JL, Bradley WG. Assessments of the Lumbar Spine Using 3D Acquisition Sequences Providing 1mm Isotropic Resolution: The Value of Multiplanar Reconstruction. Society for MRI in Med. (1992).
10. **Nissenbaum MA**, Brown SM, Song SJ, Widoff BE, Yan K, Bradley WG. Decreased Intensity of Pathology in the Left Lobe of the Liver on T2 Weighted Imaging Related to Pulsation Induced Intravoxel Dephasing: Implications for Clinical Imaging. Society for MRI in Med. (1992).

Mars Hill Wind Turbine Project

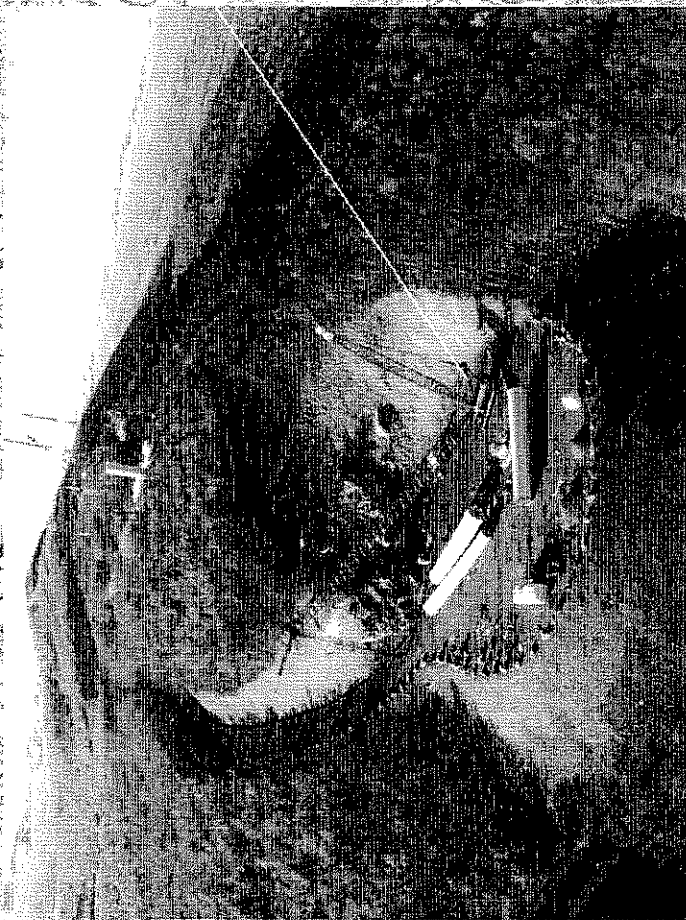
Health Effects — Preliminary Findings

- 28 turbines, 389 ft tall
- Online Dec 06, Complete Mar 07
- 20 homes North and East of turbines
- 35 adults, 16 children live within 3400 feet
- 15 people interviewed (13 face to face Mar 12, 2009) to date



30 ft. utility pole 45 ft. silo 126 ft. water tower 5 ft. 6 ft. VW man 398 ft. Lee/Dekalb turbine 125 ft. transmission tower 289 ft. Mendota Hills turbine

Locations of 28 wind turbines (red dots) and 2 meteorological towers (gold dots), based on coordinates included in the FAA's 7460-1 database for the Mars Hill windplant, Aroostook County, ME.



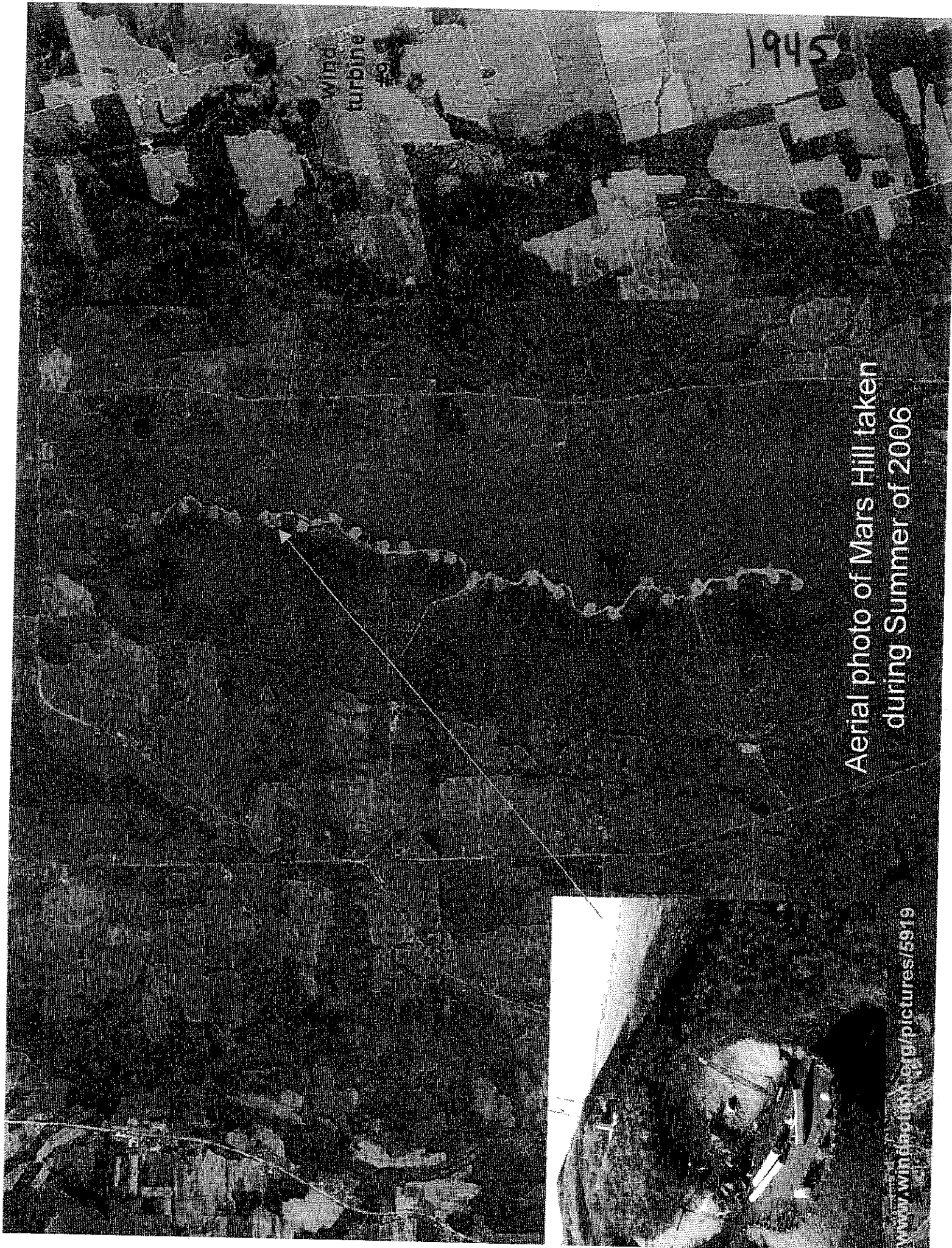
wind turbine #9

1943

1944



Mars Hill's North End - East Ridge Road



Aerial photo of Mars Hill taken during Summer of 2006

Mars Hill Experience



Mars Hill Wind Turbine Project Health Effects – Preliminary Findings

Questionnaire Used

Name	Age	Turbine Dist.	Years here	Occupation	Telephone #	email
Information provided by:						
Address:						

Pre existing medical conditions or diagnoses:			
Medications prior to WTP:			
New medical conditions or diagnoses since WTP:			
New medications or dose changes since WTP:			

Sign/Symptom	Frequency/Severity	Freq/Sev PRIOR to WTP	Improves when away?	Seen a doc? New Rx or Tx?	Comment
Sleep disturbance:					
Difficulty falling asleep:					
Waking up mid. of night:					
Headaches <input type="checkbox"/>					
Migraines <input type="checkbox"/>					
Dizziness					
Ears ringing					
Balance probs					
Unusual body sensations (specify):					
Weight: gain <input type="checkbox"/> loss <input type="checkbox"/>					
Palpitations					
Changes in appetite (spec):					
Feelings of 'Stress'					
Feelings of 'Anger'					
Feelings of 'hopelessness'					
Feelings of 'anxiety'					
Feelings of 'irritability'					
Feelings of 'Depression'					
Other					

1. Has your quality of life been altered in any way since the wind turbine project went online?

2. How so?

3. Have you considered moving away?

4. Why haven't you moved away?

I understand and consent to this information being collected as part of a medical investigation. I understand no names shall be used in any report generated with this information, and that no patient names will be released at any time. The report or excerpts from the report may be presented to government or to other bodies such as the Maine Medical Association, and may be published in journals or other media.

signature _____ date _____

print name _____

1947

1948



Mars Hill Wind Turbine Project Health Effects – Preliminary Findings

Population Sample - Demographics

- 20 homes in affected area
- Members of 9 homes interviewed
- *None of 16 children interviewed*

Interviewed:

- 7 females, age range 41-73, mean 59 years
- 8 males, age range 47-75, mean 61 years
- Distance to nearest turbine ranges 1200 – 3400 ft
Mean distance 2500 feet

Mars Hill Wind Turbine Project Health Effects – Preliminary Findings

Population Sample - Demographics

Sex	Age	Occupation	Distance to nearest turbine (ft)
F	confidential	confidential	3400
F	confidential	confidential	2400
F	confidential	confidential	2500
F	confidential	confidential	3000
F	confidential	confidential	3200
F	confidential	confidential	1200
F	confidential	confidential	2300
M	confidential	confidential	3400
M	confidential	confidential	2400
M	confidential	confidential	3000
M	confidential	confidential	3200
M	confidential	confidential	1200
M	confidential	confidential	2100
M	confidential	confidential	2400
M	confidential	confidential	2300

Mars Hill Wind Turbine Project Health Effects – Preliminary Findings
Symptoms Survey Results

SLEEP DISTURBANCES (new onset)

Sleep Disturbance (total)

14	93%
13	87%
7	47%
3	20%
2	13%
9	60%

Waking up middle of night:

Difficulty falling asleep:

1-2/WK

3-4/WK

5-7/WK

Discussed with MD:

13 87%

Offered Rx:

12 80%

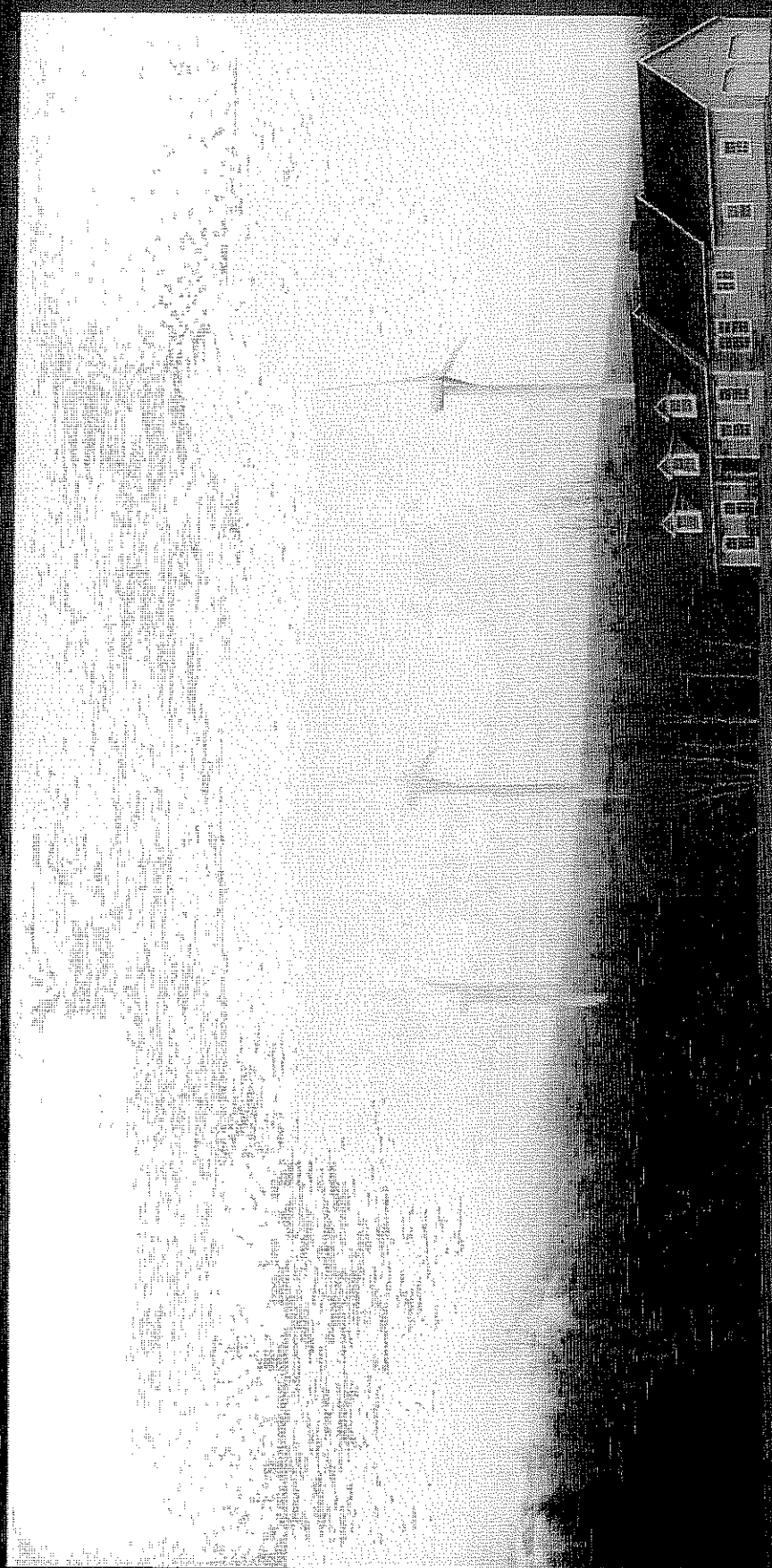
Accepted Rx:

5 33%

Offered & Declined Rx:

7 47%

1952



Mars Hill Wind Turbine Project Health Effects – Preliminary Findings

Symptoms Survey Results

Headache

Increased Headache:

8

53%

New onset headaches:

6

40%

Increased migraine frequency:

2

13%

New Rx

2

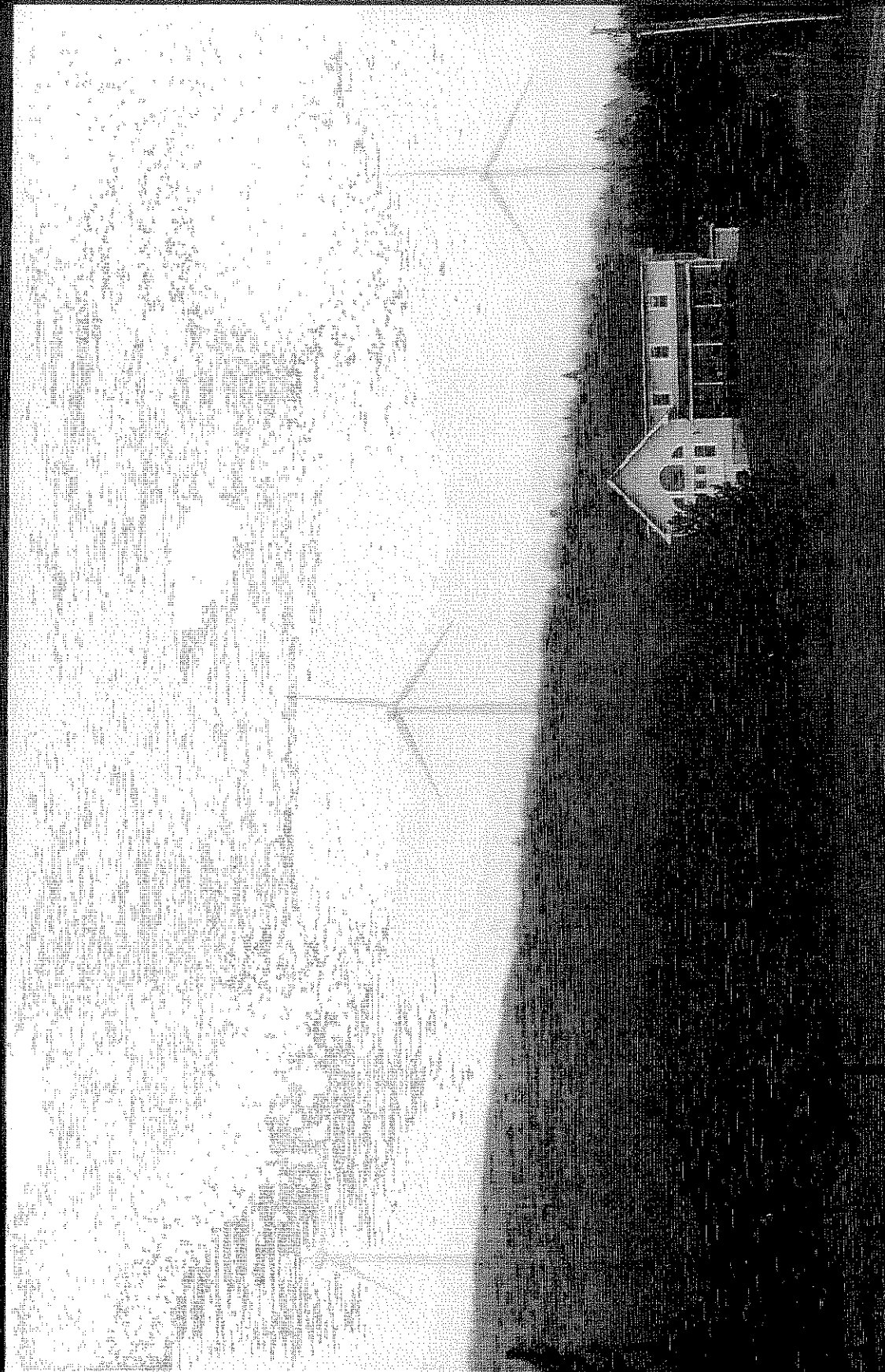
13%

Increased Migraine Rx

1

6%

1954

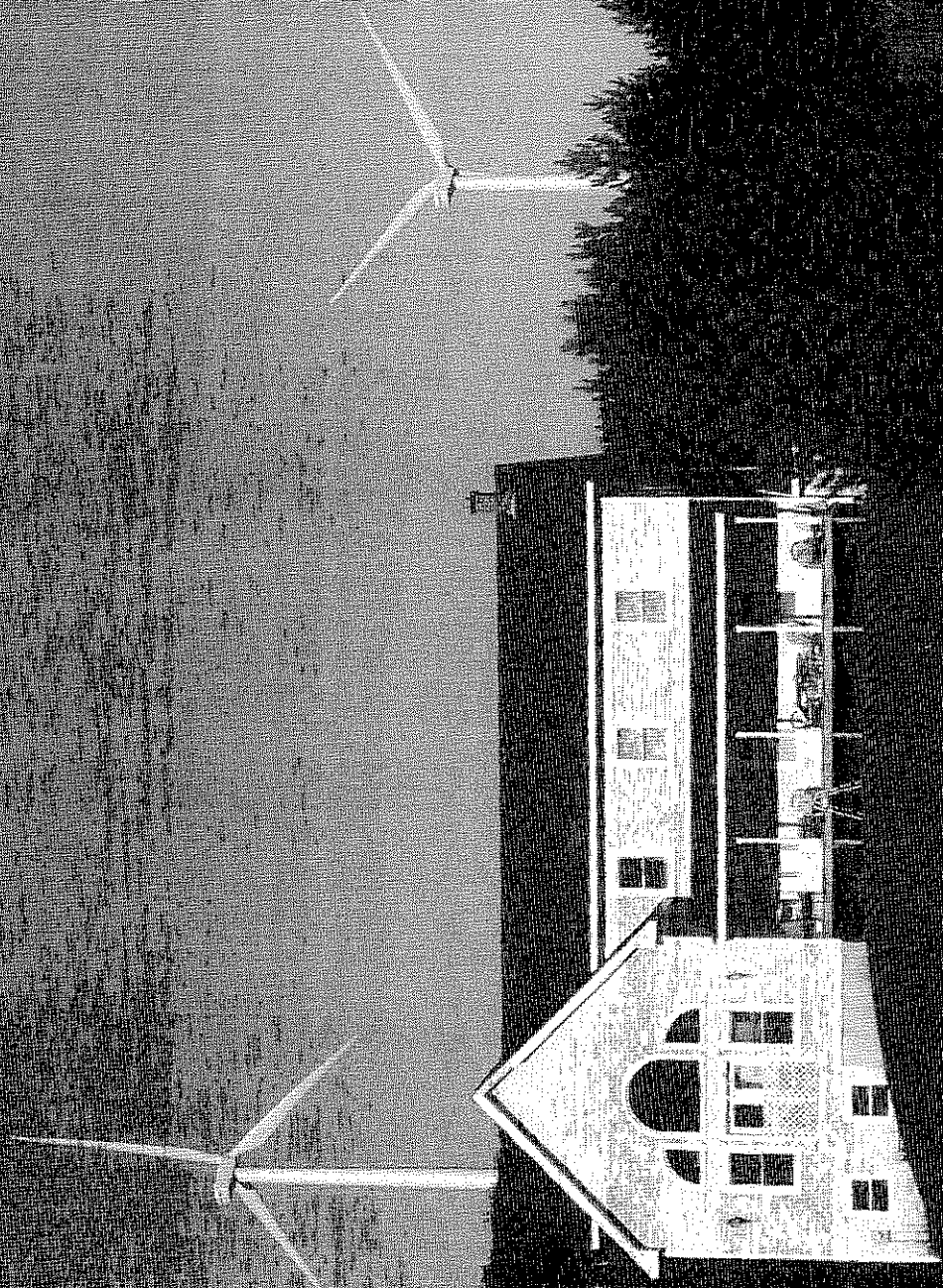


Mars Hill Wind Turbine Project Health Effects – Preliminary Findings

Symptoms Survey Results

Dizziness	3	20%
Tinnitus	1	6%
Unsteadiness	1	6%
Unusual Body sensations:	3	20%
<i>Chest pulsations</i>	2	
<i>Pulsatile ear pressure</i>	1	

1956



Mars Hill Wind Turbine Project Health Effects – Preliminary Findings

Symptoms Survey Results

Hypertension

New Dx Hypertension	3	20%
Worsened BP	1	6%
New Rx offered or increased:	4	27%
New Rx accepted or increased:	3	20%
New Rx declined:	1	

1958

Mars Hill Wind Turbine Project Health Effects – Preliminary Findings
Symptoms Survey Results

Troubled by Shadow Flicker

Troubled by Shadow Flicker:	5	33%
nausea & dizziness	2	
dizziness alone	2	
triggers migraine	1	

“ like turning a light switch on and off, on and off ,

Mars Hill Wind Turbine Project Health Effects – Preliminary Findings

Symptoms Survey Results

Weight Change

Weight changes since turbines online:

Weight gain:

Weight loss:

6	40%
5	33%
1	6%

1960



Mars Hill Wind Turbine Project Health Effects – Preliminary Findings

Symptoms Survey Results

Psychiatric Symptomatology

Feelings of:

“Stress”	11	73%
“Anger”	13	87%
“Anxiety”	6	40%
“Irritability”	4	27%
“Hopelessness”	11	73%
“Depression”(total)	8	53%
new:	7	
increased:	1	

Mars Hill Wind Turbine Project Health Effects – Preliminary Findings

Symptoms Survey Results

Anger

“ Absolute rage – you feel you want to kill someone, and don’t know who to kill ” (67 y.o. woman)

“ So angry I could kill “ (65 y.o. man)

“ Makes my blood boil ” (65 y.o. woman)

Mars Hill Wind Turbine Project Health Effects – Preliminary Findings
Symptoms Survey Results

Hopelessness

“Nobody will help us”

“No options – can’t leave, and can’t live here”

“This is an awful thing to have happen to you”

“People don’t believe us – (our complaints) fall on deaf ears”

“No one cares. No one listens.”

“They just tread on us”

“It’s very hard watching my child suffer”